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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,841	04/15/2004	Arjang Fartash	200312702-1	9435

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EXAMINER

LAVILLA, MICHAEL E

ART UNIT PAPER NUMBER

1775

DATE MAILED: 10/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/825,841

Applicant(s)

FARTASH, ARJANG

Examiner

Michael La Villa

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-56 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 20040415.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. 20051002.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:
2. The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 1-56 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
 - I. Regarding Claims 1, 46, 49, 50, 54, and all other claims that make reference to the phrase, it is unclear whether "bcc phase tantalum" means that the layer is pure Ta. If not, it is unclear what criteria are used to ascertain whether an alloy or compound meets the phase requirement.
 - II. Regarding Claim 4, it is unclear what is being claimed by the "further" limitation. The claim explains that there should be an "essentially contiguous tantalum film." It is unclear what is the distinction, if any, between a layer and a film. Since the bcc and non-bcc regions are part of the same layer, it is unclear what "contiguous" means in this context.
 - III. Regarding Claim 6, it is unclear whether this additional step means that the first layer region is to be bcc tantalum or whether this additional step refers to the relationship of the bcc phase of the tantalum layer and the substrate.

Art Unit: 1775

- IV. Regarding Claim 11 and 48, it is unclear what is the relationship between these materials and a bcc Ta layer.
- V. Regarding Claim 14, it is unclear whether the claimed layer is to be a monolayer or whether an additional monolayer is being claimed.
- VI. Regarding all of the claims where the phrase "further comprises" or the like is used, it is unclear whether applicant means that an additional limitation is being specified or whether applicant is further defining already specified limitations. Applicant may be using this phrase in the latter context which is not conventional, and both uses, which may also be occurring, further renders the claims indefinite.
- VII. Regarding Claim 52, it is unclear what is the antecedent basis of the phrase "said seed layer."
- VIII. Regarding Claim 54, it is unclear what is meant by the phrase "means for creating a tantalum layer." Applicant has explained that this is a means plus function limitation. It is unclear what is the claimed means and its function. The claimed subject matter appears to relate to a substrate coated with a Ta layer having bcc and non bcc properties as defined by the claim. It is unclear what is the role of the manner of making the film to the claimed article. Is this a product-by-process claim for which the claim is to be limited to the disclosed process and resulting layer?

Art Unit: 1775

- IX. Regarding Claims 55 and 56, it is unclear what structure is claimed by the recited means plus function as these are laminate article claims and etching solutions, for example, would not be encompassed in such an article. Are these product-by-process claims as suggested above with respect to Claim 54?

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:
5. A person shall be entitled to a patent unless –
6. (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
7. (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
8. (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
9. Claim 49 is rejected under 35 U.S.C. 102(b) as being anticipated by Colgan et al. USP 5,221,449. Colgan teaches a bcc Ta layer and a non-bcc Ta layer that are contiguous. See Colgan (col. 6, line 26 through col. 8, line 2). In view of the formation by sputtering, it would be expected that the claimed stress requirements are satisfied.
10. Claim 49 is rejected under 35 U.S.C. 102(a and e) as being anticipated by Chen et al. USPA 2003/0124262. Chen teaches a bcc Ta layer and a non-bcc Ta layer

Art Unit: 1775

that are contiguous. See Chen (paragraphs 56-58). In view of the formation by PVD, it would be expected that the claimed stress requirements are satisfied.

11. Claims 49 and 50 are rejected under 35 U.S.C. 102(b) as being anticipated by Koyama et al. USP 4,364,099. Koyama teaches a bcc Ta layer and a non-bcc Ta layer that are contiguous. See Koyama (Figure 13; col. 8, line 19 through col. 9, line 25). In view of the formation by sputtering, it would be expected that the claimed stress requirements are satisfied. Layer 103 is described as being transitional bcc Ta, and so it may satisfy the claimed "bcc-phase-tantalum forming region" of Claim 50.


Conclusion

12. None of the reviewed prior art nor prior art of record teaches or suggests the subject matter of Claims 1-48 and 51-53. Particularly, with respect to Claim 1, there is no teaching or suggestion of a method of making an article as claimed that comprises tantalum layer having both bcc and non-bcc phases. Moreover, there is no teaching or suggestion of articles made by that process as specified in several of the dependent claims. With respect to the articles of Claims 51-53, the claimed disposition of bcc and/or non-bcc phases in conjunction with the other claimed limitations is not taught or suggested. While Claims 54-56 have not been rejected over the prior art, the meaning of these claims is too indefinite as to make it possible to render a statement as to whether the reviewed prior art and prior art of record are applicable.

Art Unit: 1775

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael La Villa whose telephone number is (571) 272-1539. The examiner can normally be reached on Monday through Friday.
14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael La Villa
2 October 2005



MICHAEL E. LAVILLA PH.D.
PRIMARY EXAMINER